Town Of Hopkinton – Energy Baseline and Energy Reduction Action Plan

5/11/10

PURPOSE AND ACKNOWLEDGEMENTS

- Letter from municipal officials verifying adoption of the energy reduction plan
  - Please find attached Appendix A; a letter from Norman Khumalo, Town Manager of Hopkinton, verifying adoption of the energy reduction plan.
- List of contributors that participated in the baseline and reduction plan process
  - The energy baseline and energy reduction plan was prepared by the Town manager and members of the Hopkinton Sustainable Green Committee. Additionally the Hopkinton School Committee deserves special recognition for much of the recent and imminent progress towards energy reduction measures. The School Committee and the Sustainable Green Committee have liaisons and coordinate their energy related activities. The members of the Hopkinton Green Sustainable Green Committee are;

John Mosher	Govoni
Carol Deveuve	John Carroll
John Keane	Margo Roman
Matt Marshquist	Nancy
Andy Boyce	Dourney
Ann Randall	Ria McNamara
Christiane Perrin	Scott
Frank D'Urso	Richardson
Gino Spinelli	Tom Dawson
Gretchen	Aubrey Doyle

- Executive summary

  Using the DOER web-based energy information tool Mass Energy Insight, with 2009 as the baseline year, it was determined that the energy usage for the Town of Hopkinton was approximately 59K MMBTU's. Approximately 87% of this usage total was for municipal buildings. Significant energy efficiency measures taken in the past

two years include: installation of 1800 solar panels on four municipal buildings, providing approximately ten percent of the town's energy needs (not included in energy reduction plan since system not owned by town); increased roof insulation added to three schools; and a high efficiency boiler and hot water heater at one of the schools. Energy audits and discussions with energy service companies were conducted over the past two years for seven of the existing facilities; the four facilities identified as providing the greatest energy savings include the High School, Middle School, Hopkins School, and Town Hall. The highest priority measures to be implemented at these facilities will include HVAC re-commissioning; lighting improvements (re-lamping/re-ballasting, new fixtures, emergency lighting); occupancy sensors; energy management system; and variable frequency drive retrofit. The fuel-efficient vehicle policy and idling policy will result in approximately 9% vehicle fuel use reduction over next five years. Total energy savings is estimated to be approximately 21% over the next five years. The total projected gross cost to implement the energy efficiency measures is $2 mil with NSTAR incentives of ~$540k and a combined 3.4 year payback, with ability to finance project costs at 0% interest for two years. The projects are scheduled to be implemented between Q1/2011 and Q4/2013, however, 90% of the energy savings will be realized within two years.

I. INTRODUCTION

A. *Background*

i. Summary of the town – populations, number of municipal buildings including schools, number of vehicles, fuel usage (eg. oil, propane, natural gas)

The town Hopkinton, MA, located in Middlesex County, is approximately 26 miles WSW of Boston, MA. The population as of 2010 is 15, 448. The town has 8 Municipal Buildings, 5 School buildings and 54 town-owned vehicles (the term municipal building will refer to all town owned buildings, schools and town/administration buildings). The primary fuel for heating is natural gas, electricity is used for lighting and systems operation, and town owned vehicles use gasoline and diesel fuel.

ii. Goal of reducing fossil fuel energy use – include goals regarding any special school accreditations, Energy Star ratings, becoming a Green Community, EPA Community Energy Challenge, ICLEI community

In the past 2 years the Town of Hopkinton has implemented several energy efficiency measures including the following projects: higher wall and roof insulation incorporated into recent building projects at schools, high-efficiency boiler and HW heater installed at one school and the installation and long-term purchase agreement for a 325-kilowatt system PV solar system installed at several town facilities.

In August 2008 the Hopkinton Board of Selectmen formed the Hopkinton Sustainable Green Committee (HSGC) and appointed 17 members to the HSGC. One of tasks assigned to the HSGC was to aid the town and its residents in conservation and energy savings efforts.

In January 2010, the Town of Hopkinton approved funding for a new Town Engineer/facilities coordinator. This position will continue the work already started and manage the implementation and monitoring of the energy reduction plan. Additionally, the facilities coordinator will continue to develop the Capital Asset Management Plan (CAMP) and work towards gaining Energy Star and LEED certification for municipal buildings.

The Town of Hopkinton and the HSGC are currently focused on obtaining Green Community certification in May of 2010.

iii. Municipality's role

a. Energy use baseline inventory

The following inventory was included in the energy baseline:

- Hopkinton High School
- Hopkinton Middle School
- Town hall
- Hopkins School (Grade 4 & 5)
- Elmwood Elementary School
- Center Elementary School
- Senior Center
- Hopkinton Police Dept HQ
- Central Fire Station
- Library
- Garage (DPW)
- Woodville Fire Dept
- Water Dept
- 55 town owned and operated vehicles
    - 10 Police Department
    - 13 Fire Department
    - 27 DPW
    - 4 Schools
    - 1 Inspector

b. Energy use forecast

The current energy forecast for the Town of Hopkinton over the next 5 years is relatively stable. As the town has adopted the stretch energy code, and the town is committed to life-cycle cost analysis for the purchase of new equipment and

renovation/new building projects, we expect that that this will continue to limit energy use growth.

c. 20% reduction

The town of Hopkinton has developed a plan that will achieve 21.09% reduction in energy use over 5 years, compared to a baseline of calendar year 2009. This is achieved by a reduction of 22.90% of the 51247 MMBTUs used by facilities and a reduction of 9% of the 7671.7 MMBTUs used by vehicles, please see Table 1.

Table 1 – Summary of Energy Use and Energy Savings

	MMBTUs Usage	MMBTUs Savings	Savings %
Buildings	51247.0	11735.2	22.90%
Vehicles	7671.7	690.5	9.00%
Total	58918.7	12425.6	21.09%

d. Statement of goals and strategies to be used in carrying out the action plan

Since facilities accounted for 86.98% of all energy used by the Town of Hopkinton, reducing facility energy use was the primary focus of the energy reduction action plan. The Town of Hopkinton engaged RISE Engineering, an NSTAR approved vendor to conduct energy audits at the town facilities and based on their recommended energy conservation measures (discussed in detail in section V), developed a detailed action plan to achieve 22.90% facilities energy reduction.

Vehicle fuel use accounts for 13.02% of all energy used by the Town of Hopkinton. Vehicle energy reduction will be achieved by implementing two policies; the “fuel-efficient vehicle policy” and the “vehicle-idling policy”. The fuel-efficient vehicle policy (as required by criteria 4 of the Massachusetts Green Community application) has been developed and approved. The vehicle-idling policy will be developed and implemented over the next year. The combination of these energy conservation policies has been conservatively estimated to achieve a 9% vehicle energy reduction.

II. RESULTS OF ENERGY USE BASELINE INVENTORY

A. *Inventory tool used*

The Town of Hopkinton will use DOER’s web-based energy information tool, Mass Energy Insight to baseline facilities energy use. The baseline year for the energy use inventory is CY 2009, this was chosen in order to take advantage of the Mass Energy Insight tool’s automatic

upload of gas and electric utility data. John Mosher, chair of the Hopkinton Sustainability Green Committee attended the DOER Mass Energy Insight training in February 2010.

Vehicle energy use was baselined by collecting energy use data from each of the departments that have town-owned vehicles. This is currently a manual process, but efforts are being made to automate the data collection to aid in the verification of energy reduction measures.

B. *Existing municipal energy use*

i. Municipal buildings

The Town of Hopkinton has 13 Municipal buildings (Including schools). These buildings exclusively use gas and electricity. The total of municipal building energy use for CY2009 was 51247 MMBTUs. Municipal buildings accounted for 86.98% of energy used by the town, and consequently will be the major focus of the energy reduction plan.

ii. Vehicles

The town of Hopkinton has 55 town owned and operated vehicles (including Police Dept, Fire Dept, DPW and Schools and Inspection). Vehicle energy use for CY2009 was 7671.7 MMBTUs. Vehicle energy use accounted for 13.02% of total energy used by the town, and will be addressed by the energy reduction plan.

In addition there are 25 School busses operated by an outside contractor. The fuel used by school busses is **not** included in this application.

iii. Street and traffic lighting

Streetlights in the town of Hopkinton are owned and operated by NSTAR. Consequently, energy use from streetlights is **not** included in the baseline and is **not** included in the energy reduction plan.

iv. Energy use by fuel type

Total energy used in the town of Hopkinton in CY2009 was 58918.72 MMBTUs. The breakdown by fuel type is as follows:

Natural Gas – 51%
Electricity – 36%
Diesel – 8%
Gasoline – 5%

Figure 1. shows overall breakdown by fuel type. Figure 2 shows fuel type by facility.

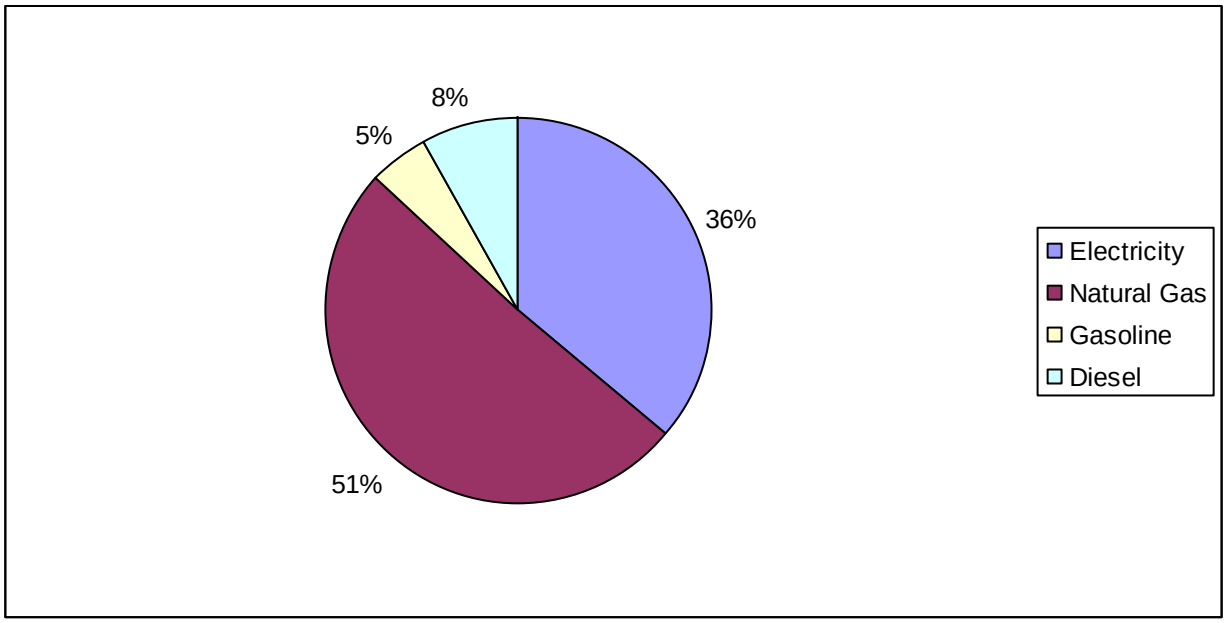


Figure 1 Energy use by Fuel type

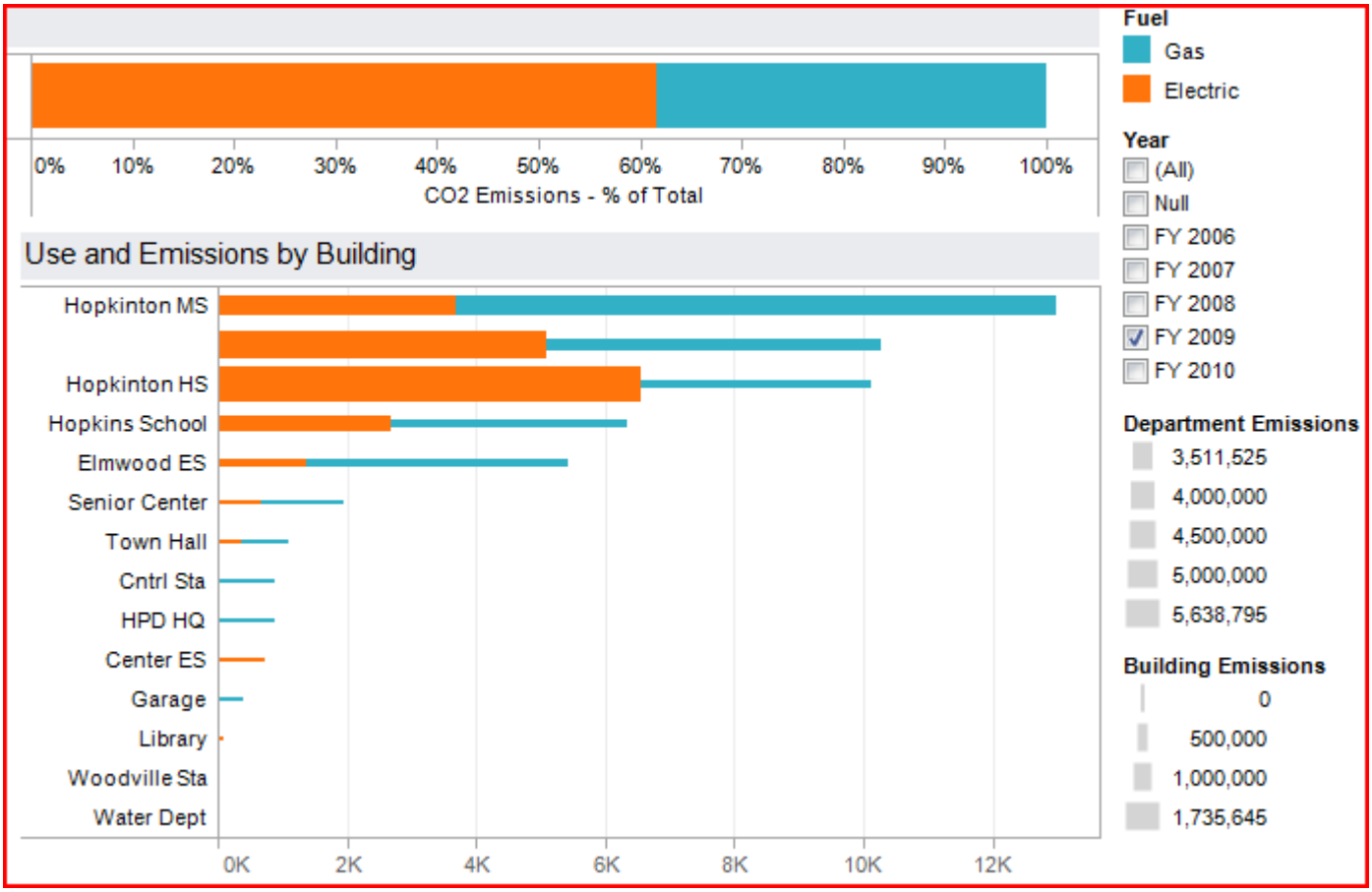


Figure 2 - Fuel use by Facility

C. *Existing efficiency measures implemented in last 2 years*

The Town of Hopkinton has implemented several energy efficiency measures in the past 2 years. These include the following projects:

- Higher roof insulation incorporated with the new Center School project.
- High-efficiency boiler and HW heater installed at the Center school.
- Higher insulation-value roof repairs completed at the Middle School.
- Incorporated insulated wall panels as value-engineered solution to the Middle School wall repairs.

These energy saving measures are reflected in the baseline and will not be included in the energy reduction plan.

In 2009 the town of Hopkinton entered into a long-term purchase agreement with Boston Community Capital who installed 1,800 solar panels at the high school, the middle school, the police and fire stations. The 325-kilowatt system is expected to provide about 10-15 percent of the energy needs of Hopkinton Municipal buildings. Hopkinton is the first town in Massachusetts to install solar panels on multiple municipal buildings. Despite the fact that the installation of this solar panel system will significantly reduce fossil-fuel consumption, the system is not owned and operated by the Town of Hopkinton and so will **not** be included in the energy reduction plan.

Many of the energy conservation measures implemented in the past two years have been driven by and implemented at the Hopkinton School System, and the Hopkinton School Committee deserves special recognition for their progress in implementing energy reduction measures.

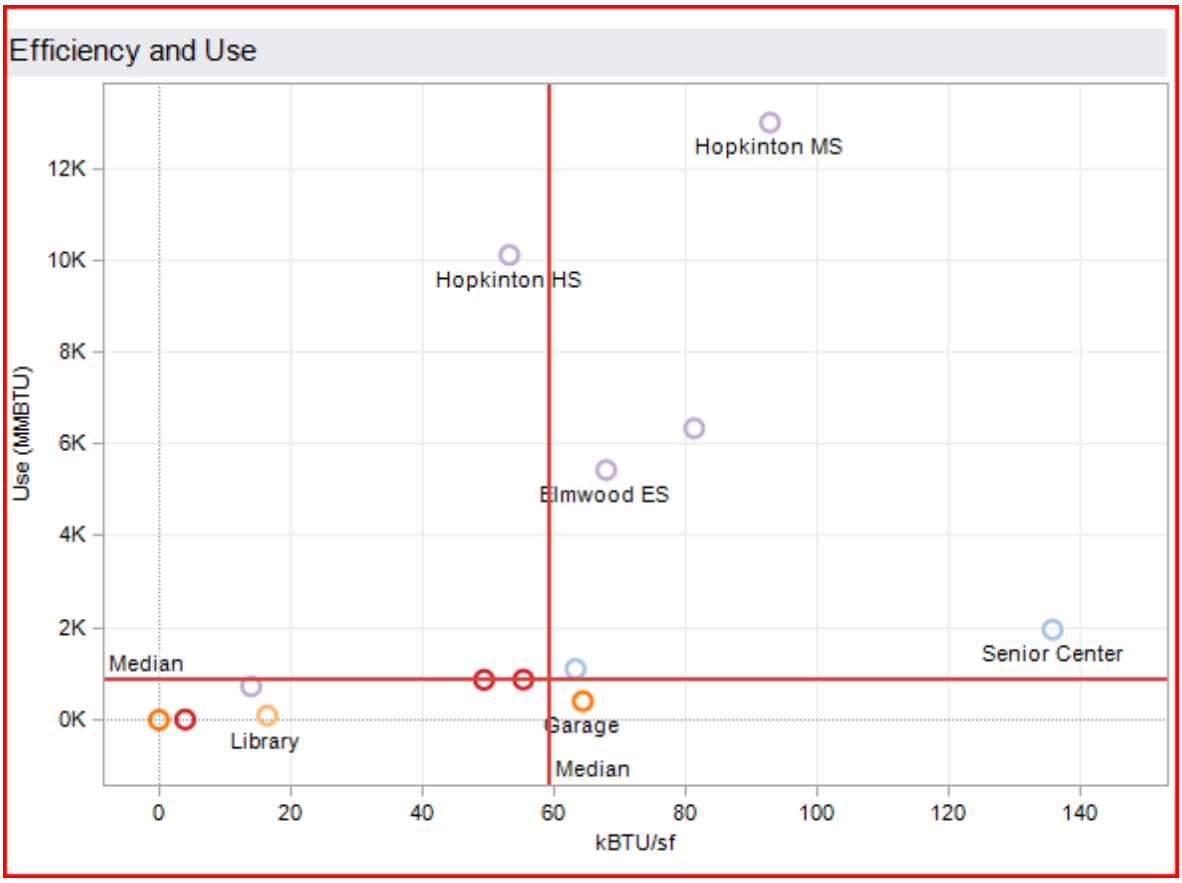
Over the past two years the town of Hopkinton investigated implementing energy savings through a performance contract with Siemens Energy services, and engaged the services of Rise Engineering to perform energy audits at seven of the larger municipal buildings. The result of these energy audits are discussed in detail in other sections of this application.

Additionally, the town of Hopkinton has approved funding for a new Town Engineer/facilities coordinator. This position will continue the work already started and manage the implementation and monitoring of the energy reduction plan.

D. *Areas of least efficiency/greatest waste and Areas that can be most easily addressed*

Using the DOER's web-based energy information tool, Mass Energy Insight, charts were produced that highlight the least efficient and higher energy use facilities (see figures 3 & 4). This information has been incorporated into our energy reduction plan and this information will help set prioritization of the sequence that the energy conservation measures are implemented.

Figure 3 – Efficiency and Energy use



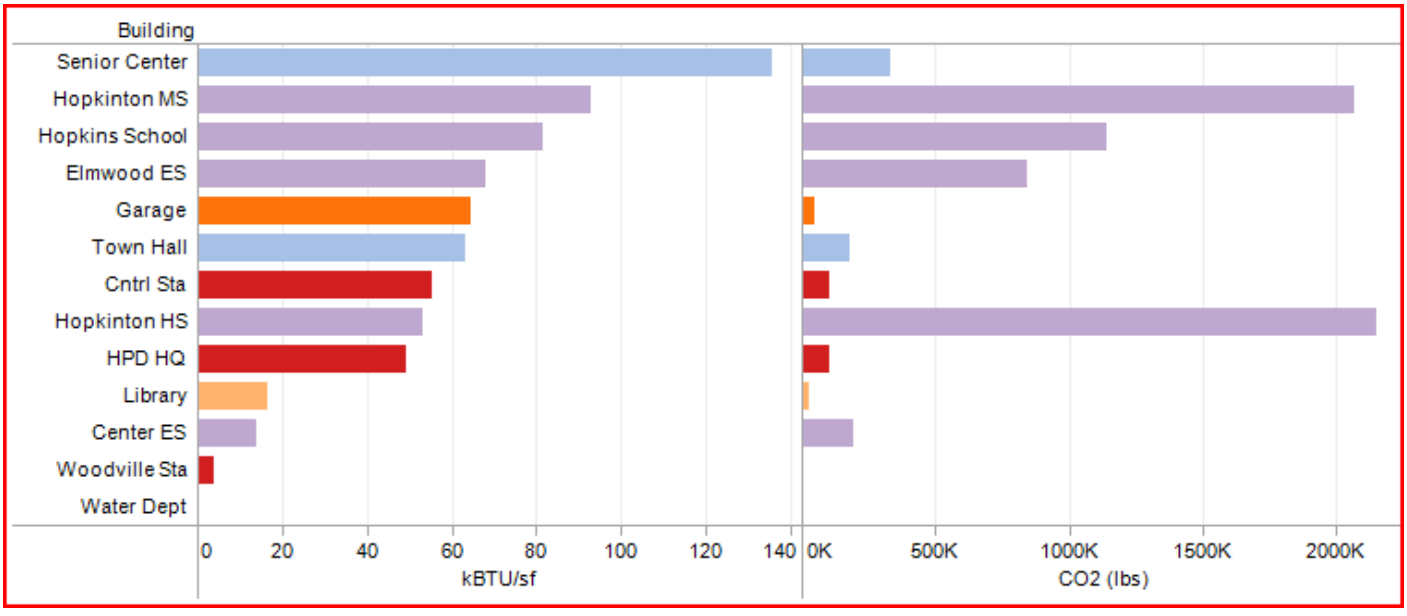


Figure 4 - Building Efficiency and Emissions

III. SUMMARY OF ENERGY AUDIT &
IV. SUMMARY OF FOSSIL FUEL REDUCTION MEASURES

A. *Getting to 20%*

i. Prioritized list of strategies to reduce fossil fuel usage

a. Municipal Buildings

Over the past two years the town of Hopkinton has conducted energy audits of seven of the existing facilities and held discussions with energy service companies (ESCOs) in order to determine the best strategy to implement energy conservation measures. The seven facilities audited represent 71.7% of the energy used by municipal buildings. Most of the recommendations will be applied in some part to similar facilities that were not specifically audited. The total energy reduction that will be achieved when all energy conservation measures are implemented will be 11735.18 MMBTUs or a reduction 22.9% of CY2009 use. Four facilities (High school, Middle School, Hopkins School and Town Hall) account for 77.41% of energy reduction. The energy reduction implementation plan will prioritize implementing the energy conservation measures at these facilities in order to obtain the greatest energy savings in the shortest amount of time.

The majority of the energy conservation measures fall into the following categories:

- HVAC re-commissioning (CO2 monitors, AHU replacement)
- Demand Control Ventilation
- Lighting- Re-lamping & Re-ballasting
- Lighting - New Fixtures
- Occupancy Sensors
- Energy Management System – installation and or upgrade
- Emergency Lighting Controls
- AC variable frequency drives (VFD)
- Window replacement and air sealing of older facilities
- Vending Miser Controls

Discussions where held with Siemens Government Service and individual audits were conducted by Rise Engineering. Inclusion of the rebates available from our utility company

NSTAR, under the NSTAR Business Solutions Program-Municipal, and 0% financing over 2 years, the payback period was 3-4 years for energy conservation measures identified. The town of Hopkinton has determined that the most cost effective way to reach our short-term energy reduction goals is to implement the individual energy conservation measures identified with an NSTAR approved vendor in the NSTAR Business Solutions Program-Municipal.

b. Vehicles

In keeping with criteria 4 of the Massachusetts Green Community application, the town of Hopkinton has implemented a fuel-efficient vehicle policy. The town is also developing a vehicle idling policy designed to restrict the amount of time vehicles can idle. Over the next 5 years, the combination of these two policies have been calculated to save 690.45 MMBTUs in vehicle energy use, or 9% reduction in energy use compared to CY2009 energy use.

c. Streetlights and traffic lights

Streetlights in the town of Hopkinton are owned and operated by NSTAR. Consequently, energy use from streetlights is **not** included in the baseline and is not included in the energy reduction plan.

d. Summary of fossil fuel reduction measures

The total energy use for the Town of Hopkinton including municipal buildings, vehicles, streetlights and traffic lights is 58918.72 MMBTUs. The total energy saved by implementing the proposed energy reduction measures is 12425.63 MMBTUs, which represents a cumulative reduction 21.09% in the Town's energy use over the next five years, which meets the requirements of the Green Communities criteria number 3.

V. FOSSIL FUEL ENERGY REDUCTION MEASURES

A. *Short-term energy reduction goals – getting to 20% reduction in 5 years*

a. Municipal Buildings (including schools) – General goals

The town of Hopkinton has conducted a comprehensive audit of seven facilities and a walk through audit of the remaining facilities and has been able to identify specify energy conservation measures that will significantly reduce our energy consumption over the next 5 years. Energy conservation measures have been selected that have a quantifiable energy saving and on average have payback of less than five years. The top 10 energy

conservation projects, in order of energy savings, will be presented on a facility-by-facility basis. Four of the smaller measures are grouped into a single project, project 10. All of these projects are at various stages of implementation, from the proposal stage to the final stage of project completion. The school system, has taken a very proactive role in implementing energy conservation measures, and deserves special credit for progress implementing energy reduction measures.

b. Prioritized List of Specific Projects and Projected Energy savings

Table 2. Project #1 – Hopkinton High School

Energy conservation measure	Total Savings MMBTU
HVAC RE-COMMISSIONING: Re-commission entire HVAC System with energy efficiency in mind. Install, CO2 monitors, Occupancy Sensors, and add to sequence of operation.	1394.51
Lighting-Re-lamping & Re-ballasting	268.74
Lighting-New Fixtures	295.67
Lighting-Gym & Atrium	598.09
Occupancy Sensors	344.64
Vending Miser Controls	41.14
Emergency Lighting Controls	302.14
VFD on AHU #7	125.95
Total	3370.88

Table 3. Project #2 – Hopkinton Middle School

Energy conservation measure	Total Savings MMBTU
Lighting-Classrooms	237.14
Lighting-Gym-Café-Aud-Library	404.81

Lighting-Common Areas	282.02
Occupancy Sensors	219.68
Vending Miser Controls	11.00
EMS	190.55
VFD'S & Motors	151.11
Demand Control Ventilation	107.29
Building envelope - air sealing	956.48
Total	2560.08

Table 4. Project #3 – Town Hall

Energy conservation measure	Total Savings MMBTU
Lighting and occupancy sensors	85.34
Energy Management system	301.70
Exhaust fan controls	92.54
Demand control ventilation	84.80
VFD retrofit	1147.50
AHU replacement	37.70
Total	1749.59

Table 5. Project #4 - Hopkins School

Energy conservation measure	Total Savings MMBTU
HVAC RE-COMMISSIONING:	690.68
Lighting-Re-lamping & Re-ballasting	133.91
Lighting-New Fixtures	148.00

Occupancy Sensors	169.15
Vending Miser Controls	11.00
Emergency Lighting Controls	155.05
Total	1307.78

Table 6 - Project #5 – Elmwood School

Energy conservation measure	Total Savings MMBTU
Lighting-Re-lamping & Re-ballasting	76.52
Lighting-New Fixtures	84.57
Occupancy Sensors	96.65
Vending Miser Controls	11.00
Emergency Lighting Controls	88.60
Window - replacement survey results	362.45
Building envelope - air sealing	443.00
Total	1162.80

Table 7. Project 6 – Center School

Energy conservation measure	Total Savings MMBTU
Install, CO2 monitors, Occupancy Sensors, and controls HVAC operation.	197.34
Lighting-Re-lamping & Re-ballasting	38.26
Lighting-New Fixtures	42.29
Occupancy Sensors	48.33
Vending Miser Controls	11.00

Emergency Lighting Controls	44.30
Window - replacement survey	201.36
Total	582.87

Table 8. **Project 7 – Senior Center**

Energy conservation measure	Total Savings MMBTU
Lighting and Occupancy sensors	26.82
Emergency lighting control	90.81
Demand control ventilation	333.02
VFD and Motor retrofit	27.14
Total	477.79

Table 9. **Project 8 – Hopkinton Police Dept – Headquarters**

Energy conservation measure	Total Savings MMBTU
Lighting and occupancy sensors	120.32
Vending Miser controls	5.50
Exhaust fan controls	6.24
Demand control ventilation	29.50
VFD retrofit	39.15
Total	200.72

Table 10. **Project 9 – Hopkinton Fire Dept – Headquarters**

Energy conservation measure	Total Savings MMBTU
Lighting and occupancy sensors	126.64
Vending Miser controls	5.50
Total	132.14

Table 11. Project 10 - Hopkinton Public Library, Woodville Fire Station, DPW Garage, Water Dept

Library	
Lighting-Re-lamping & Re-ballasting	15.30
Lighting-New Fixtures	16.91
Occupancy Sensors	19.33
Emergency Lighting Controls	17.72
Woodville Fire Station	
Lighting and occupancy sensors	24.16
Vending Miser controls	5.50
DPW Garage	
Lighting and occupancy sensors	56.41
Vending Miser controls	5.50
Water Dept	
Lighting and occupancy sensors	24.16
Vending Miser controls	5.50
Total	190.51

c. Estimated Project Capital and Operating Costs

The Town of Hopkinton plans to use an NSTAR approved vendor in the NSTAR Business Solutions Program-Municipal to implement this project. The vendor will conduct procurement, project management, installation, startup and training and the cost of these services is reflected in the project cost in table 12. The town engineer/facility coordinator will also supervise the implementation of these projects.

Table 12 – Net cost and Return on Investment

Project	Project Cost	NSTAR Incentives	Customer Net Cost	Yearly saved	Return on Investment	Years to Payback
1 - Hopkinton High School	$457,093	$212,042	$245,051	$130,343	53.19%	1.88
2 - Hopkinton Middle School	$506,469	$117,497	$388,972	$105,998	27.25%	3.67
3 - Town hall	$192,813	$42,585	$150,228	$25,980	17.29%	5.78
4 - Hopkins School	$258,299	$46,999	$211,300	$55,119	26.09%	3.83
5 - Elmwood ES	$232,469	$37,599	$194,870	$41,339	21.21%	4.71
6 - Center ES	$139,482	$16,920	$122,562	$22,737	18.55%	5.39
7 - Senior Center	$73,064	$23,670	$49,394	$19,552	39.58%	2.53
8 - PD HQ	$44,430	$15,292	$29,138	$11,408	39.15%	2.55
9 - Fire Dept HQ	$34,118	$11,328	$22,790	$6,509	28.56%	3.50
10 - Hopkinton Public Library, Woodville Fire Station, DPW Garage, Water Dept	$60,989	$15,856	$45,134	$9,388	20.80%	4.81
Total	$1,999,227	$539,787	$1,459,439	$428,373	29.35%	3.41

Under the NSTAR Business Solutions Program-Municipal, the Town of Hopkinton has the option to finance the net cost of this project at 0% interest rate for twenty-four months, making monthly principal payments over that period. The projects have been prioritized based on MMBTU savings, but the Town of Hopkinton may modify the schedule to prioritize financial savings. In particular, some expensive HVAC upgrades have been targeted for the town hall that do not qualify for significant NSTAR incentives. The town of Hopkinton may

delay implementation of those particular upgrades until more favorable incentives are available. In May 2010, the NSAR approved vendor was contacted to verify that the cost estimates and incentives were still valid and in effect. As of May 12, 2010 the cost estimates and incentives referenced in this plan are valid and available to the Town of Hopkinton.

d. Schedule for implementation

These projects are scheduled to be implemented over three years, starting in Q1 CY2011, completing by the end of CY 2013. Most of the individual projects can be completed within an 8-10 week timeframe from the time that the contract by the Town of Hopkinton and incentives are approved by NSTAR, however projects 1, 2 & 3 are expected to take 16 – 20 weeks. Table 13 depicts the proposed schedule.

Table 13 – Implementation Schedule

	Q1 CY2011	Q2 CY2011	Q3 CY2011	Q4 CY2011	Q1 CY2012	Q2 CY2012	Q3 CY2012	Q4 CY2012	Q1 CY2013	Q2 CY2013	Q3 CY2013	Q4 CY2013
Project 1	1	1										
Project 2			2	2								
Project 3				3	3							
Project 4						4						
Project 5							5					
Project 6								6				
Project 7									7			
Project 8										8		
Project 9											9	
Project 10												10

While the implementation of the energy conservation measures will be implemented in an almost linear manner, the energy savings will be non-linear and largely front end loaded, with 51% of energy savings realized at the end of the first year and 91% of energy savings realized by the end of the second year, as depicted in figure 5.

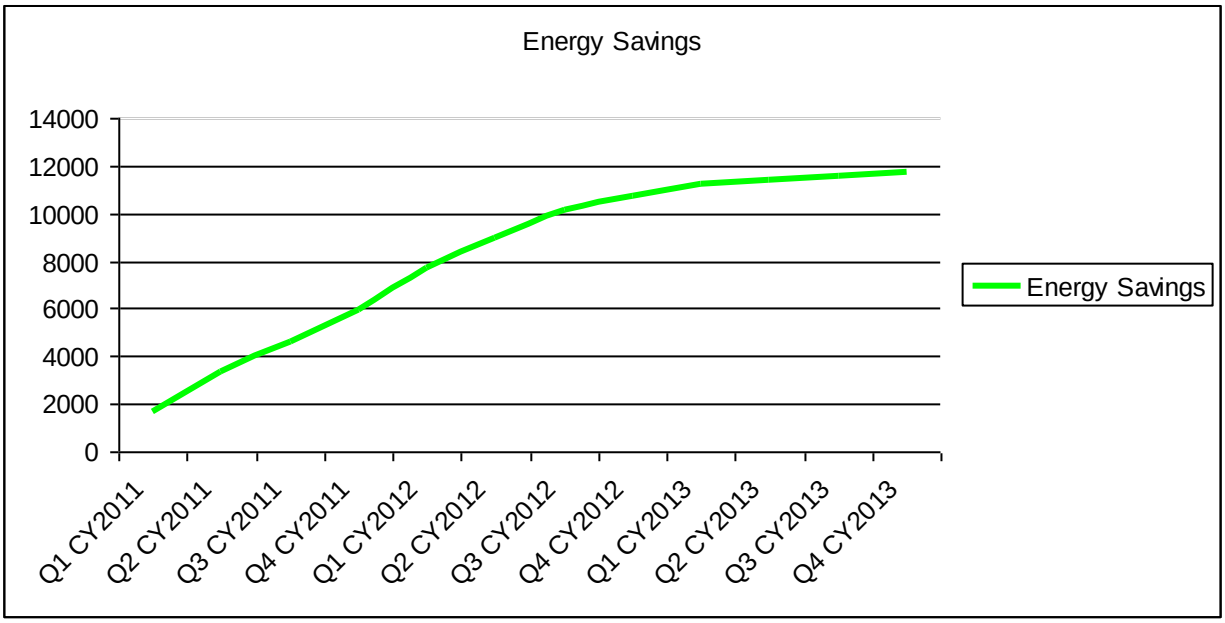


Figure 5

ii. Vehicles (including schools)

a. Areas of vehicle fleet affected

Vehicle energy reduction is achieved by implementing two policies, the "fuel-efficient vehicle policy" and the "vehicle-idling policy". The fuel-efficient vehicle policy (as required by criteria 4 of the Massachusetts Green Community application) has been developed and approved. The vehicle-idling policy will be developed and implemented over the next year. Vehicle fuel use accounts for 13.02% of all energy used by the Town of Hopkinton.

b. New vehicle/technology costs

There are no costs involved with implementing the vehicle-idling policy. The exact costs involved with implementing the fuel-efficient vehicle policy are unknown at this time, but it is expected that with lowered operating costs and lower depreciation costs, there will be minimal net additional cost to implement the fuel-efficient vehicle policy. Also with higher federal mandated MPG requirements, it is expected that the fuel-efficient vehicle purchase requirement can be met with mass produced fleet vehicles, minimal additional cost over equivalent functionality vehicles in use today.

c. Projected Annual energy savings

The combination of the "fuel-efficient vehicle policy" and the "vehicle-idling policy" have been estimated at 9% of vehicle fuel used, or 690.45 MMBTUs per year by the end of the fifth year of the energy reduction plan.

d. Timing of anticipated purchase

The "vehicle-idling policy" will be developed and implemented in the next year and will effect all vehicles (except police vehicles). It is estimated that "fuel-efficient vehicle policy" will affect 14 to 16 vehicle replacement purchases by the end of the 5-year energy reduction plan.

iii. Street and traffic lighting

a. General goals and specific projects

Streetlights in the town of Hopkinton are owned and operated by NSTAR. Consequently, energy use from streetlights is **not** included in the baseline and is **not** included in the energy reduction plan.

iv. Municipally-owned and operated clean renewable or alternative energy installations

a. Project overview

In 2009 the town of Hopkinton entered into a long-term purchase agreement with Boston Community Capital who installed 1,800 solar panels at the high school, the middle school, the police and fire stations

It is the understanding of the town of Hopkinton that because the system is not owned and operated by the Town of Hopkinton it cannot be included in our energy reduction plan. Consequently this installation will **not** be included in the energy reduction plan.

At this time the Town of Hopkinton does not have specific plans to install municipally owned and operated clean renewable or alternative energy installations, but we have identified suitable sites for installation, and will pursue additional installations if sufficient funding is made available.

v. Total projected fossil fuel energy reduction

The total fossil fuel energy reduction is 12425.6 MMBTUs by the end of the fifth year of the energy reduction plan. The majority of energy savings, 11735.2 (94.44%) are achieved by implementing energy savings at the 13 town owned facilities. The remaining energy savings, 690.5 MMBTUs (5.56%) are achieved by implementing two vehicle policies. Please see table 1 in the introduction section.

B. *Measurement and Verification Plan for Projected Reductions*

i. Provide Common Technology Features as applicable, e.g. submetering, smart metering, energy management systems

The majority of Hopkinton Municipal facilities have, or will have by the completion of the energy reduction plan, an energy management system (EMS). These individual energy management systems will be used to verify the projected savings of the individual energy conservation measures and effectively commission the installed energy efficient equipment. The Town of Hopkinton will require a performance guarantee in the contracts with the NSTAR approved vendor, with a 6 month and 12 month performance review with the vendor that implements the energy conservation measure.

ii. Energy Information Reporting System

a. Centralized Compilation of data and creation of tracking reports and Comparison of actual vs projected reductions

V.B.ii.a.1 Facilities

The Town of Hopkinton will use DOER's web-based energy information tool, Mass Energy Insight and the available reports to track energy use and compare actual vs projected reductions for facility energy use. In addition energy management systems will be used to verify short-term reductions in energy use and effectively "commission" or verify that the installation was installed as designed. Adjustments for variations in outside air temperature compared to the previous interval of the baseline will be made by using available "heating and cooling degree" days. The Town of Hopkinton will use available reports on the Mass Energy Insight website. Specifically the following three generally available reports have been used to generate the energy use baseline and will continue to be used to measure and verify the projected reductions:

- Baseline_Report
- Building_To_Target
- Monitoring_Cost_Dashboard

V.B.ii.a.2 ***Vehicles***

Vehicle energy use is monitored by collecting energy use data from each of the departments that have town-owned vehicles. The vehicle energy use data will be reviewed monthly to verify that we are achieving the projected reductions. This is currently a manual process, but efforts are being made to automate the data collection to aid in the verification of energy reduction measures. This will be a focus of the Town Engineer/Facilities Coordinator.

C. ***Long--term energy reduction goals – Beyond 5 years***

The Town of Hopkinton will continue to identify opportunities to reduce energy use beyond those measures identified in this document. While the primary focus has been on the 5-year plan, the Town of Hopkinton will continue to identify opportunities to achieve long-term energy reduction including, but not limited to:

- Identify additional facilities where PV solar panels can be installed to supplement the 325-kilowatt system that was installed in 2009. These PV solar panels may be town owned or privately owned depending on incentives available at the time.
- Evaluate locations within the town of Hopkinton that can host a ground based Solar Farm.
- Hiring of a Town Engineer/facilities coordinator. This position will continue the work already started and manage the implementation and monitoring of the energy reduction plan. Additionally, the facilities coordinator will continue to develop the Capital Asset Management Plan (CAMP) and work towards gaining Energy Star and LEED certification for municipal buildings.
- The town has adopted the stretch energy code, and the town is committed to life cycle cost analysis for the purchase of new equipment and renovation/new building projects. We expect that that this will continue to limit energy-use growth beyond five years.
- The town is investigating the implementation of a “Renewable Energy Revolving Fund and Betterment Program”. This would allow the town to offer loan programs to property owners for renewable energy improvements, and provide a legal mechanism to set up a revolving fund for this purpose.
- As the town realizes savings from the current energy savings measures outlined in this document, it is expected that we will be able to set aside some portion of these savings to fund future energy conservation measures, making energy savings “self-funding” and self-perpetuating.

VI. CONCLUSION

Over the past two years The Town of Hopkinton has invested significant time and resources understanding how we use energy and identifying ways to reduce our energy use. These efforts have put us in a good position to apply for Massachusetts Green Community status in May 2010. In particular, the detailed energy audits of our facilities provided us with a strong base for our energy reduction plan. The town of Hopkinton has also invested significant efforts in a 325-kilowatt PV solar system that will significantly reduce our carbon fuel use, but will not contribute towards our Green Community status, however we believe it is consistent with the goals of the Green Community initiative.

The Town of Hopkinton understands how it uses energy and has completed a thorough baseline of its energy use. In addition, the Town of Hopkinton has developed a comprehensive and detailed plan to reduce its energy use by slightly over 21% over the next 5 years. Ninety-five percent of the overall savings will be achieved by implementing energy savings measures

at the 13 municipal facilities (including schools). The energy conservation measures were focused on facilities, as there are proven and measurable strategies for reducing the energy use and verifying the energy savings at these facilities. Five percent of the energy savings come from common-sense energy saving measures in vehicle energy use, including a fuel-efficient, and vehicle-idling policy. We believe that this baseline and energy reduction plan meets the requirements of Green Communities criteria number 3.

The Town of Hopkinton is committed to energy conservation, and strives to be a leader in municipal energy conservation.

List of Resources – Identify resources that are available (websites, documents, tools)

http://www.hopgreen.com/

http://www.hopkinton.org/index.html

http://www.massenergyinsight.net/

Contacts –

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